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## Partisan Cycles in Congressional Elections and the Macroeconomy

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PARTISAN CYCLES IN  
CONGRESSIONAL ELECTIONS AND  
THE MACROECONOMY

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In the postwar United States the president's party has always done worse in the midterm congressional elections than in the previous congressional election. Republican administrations exhibit below-average, and Democratic administrations above-average, economic growth in the first half of each term, whereas in the latter halves the two see equal growth. Our rational expectations model is consistent with these two regularities. In presidential elections, voters choose between two polarized candidates. They then use midterm elections to counterbalance the president's policies by strengthening the opposition in Congress. Since presidents of different parties are associated with different policies, our model predicts a (spurious) correlation between the state of the economy and elections. Our predictions contrast with those of retrospective voting models, in which voters reward the incumbent if the economy is doing well before the election. Our model performs empirically at least as well as, and often better than, alternative models.

Macroeconomics and macropolitics are deeply interconnected. In the years since the conclusion of the Second World War in the United States there have been some strong empirical regularities in both the economic and political arenas. A political regularity, the midterm congressional cycle, is well known. As shown in Figure 1, the party holding the White House has lost vote share in midterm elections both in the House and in the Senate. The figure shows the Republican percentage of the two-party vote. For the intervals from "on" to "off" years (1948-50, 1952-54, etc.), the curves always slope downwards with a Republican in office and upwards with a Democratic president.

A macroeconomic regularity was first noted by Hibbs (1977), who showed that

unemployment tended to fall when the Democrats occupied the White House and rose on a Republican watch.<sup>1</sup> Alesina and Sachs (1988), and Alesina (1988b) refined this observation, by showing that real

Figure 1. The Midterm Election Cycle:  
Republican Percent Two-party Vote

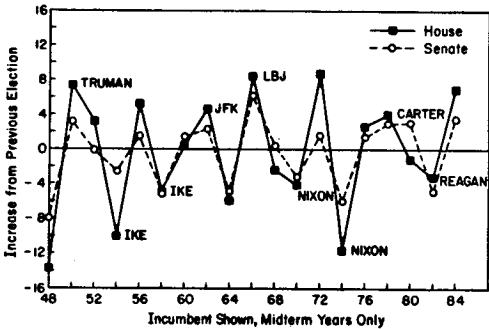


Table 1. Rate of Growth of Real GNP

Administrations	Years			
	First	Second	Third	Fourth
Democratic				
Truman	.0	8.5	10.3	3.9
Kennedy/Johnson	2.6	5.3	4.1	5.3
Johnson	5.8	5.8	2.9	4.1
Carter	4.7	5.3	2.5	-.2 <sup>a</sup>
Average	3.3	6.2	5.0	3.3
Average 1st/2d halves	4.8		4.1	
Republican				
Eisenhower I	4.0	-1.3	5.6	2.1
Eisenhower II	1.7	-0.8	5.8	2.2
Nixon	2.4	-0.3	2.8	5.0
Nixon/Ford	5.2	-0.5	-1.3 <sup>a</sup>	4.9
Reagan I	1.9	-2.5	3.6	6.4
Reagan II	2.7	2.5	—	—
Average	3.0	-0.5	3.3	4.1
Average 1st/2d halves	1.2		3.7	

Source: *Economic Report of the President 1987* (Washington: GPO, 1988).

<sup>a</sup>Oil shocks.

gross national product tends to increase at above-average rates in the first two years of Democratic administrations and increase at below-average rates in the first two years of Republican administrations, while the second halves of the two administrations show little if any difference (see Table 1). Similar results hold for unemployment (Chappell and Keech [1988] and Alesina [1988b]). In particular, five of the seven postwar recessions have started soon after a Republican president was elected. Complementing these results on output and unemployment, several researchers—including Alesina (1988b), Alesina and Sachs (1988), Beck (1982, 1984a), Chappell and Keech (1988), Havrilesky (1987), Hibbs (1987); and Tabellini and La Via (n.d.)—find that monetary policy has been “looser”—thus more inflationary—when a Democrat rather than a Republican was in the White House.

We present a model consistent with these two regularities. Individual agents in both the economy and the electorate are fully rational and forward looking, as in Chappell 1983 and Chappell and Keech 1985. Frictions in the economy and the political process generate the observed cyclical behavior. The political friction is that candidates have polarized policy preferences. We treat these preferences as exogenous and do not model them. The presence of polarization during the postwar period is supported not only by casual observation but also by empirical studies of voter evaluations of presidential candidates (Poole and Rosenthal 1984b), of interest group evaluations of members of Congress (Poole and Daniels 1985; Poole and Rosenthal 1984a), and of roll call voting patterns (Poole and Rosenthal 1985a, 1985b). Democrats have a higher tolerance for inflation and a lower

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tolerance for unemployment than do Republicans. Because the outcome of elections cannot be fully anticipated, these policy preferences will lead to expectation uncertainty.

The economic friction is that plans and contracts made prior to elections cannot be immediately revised once the winner is known. In addition, in the model, economic agents cannot enter into state-contingent contracts that provide insurance against electoral risk. Specifically, some wage contracts are signed while the inflation rate that will occur after the election is still unknown, since there is electoral uncertainty. Thus, even a rational public cannot predict with certainty the postelection inflation rate. This generates a short-run Phillips curve, even in a rational expectations model. However, since contracts and plans can be reformulated after the election, the real effects diminish over time and eventually disappear. This is consistent with the observation that the real effects on output and unemployment are largely concentrated at the beginning of each administration.

The inability to anticipate elections also affects the behavior of pivotal voters, who in our model are moderate relative to either party. They would like policies that stood between those pursued by Democratic and Republican presidents. Since we assume that actual policy is unidimensional and a function of the preferences of the executive and of the relative strength of the two parties in Congress, pivotal voters can use their congressional votes to moderate the outcomes of presidential elections.

Some of this moderating behavior may take place in presidential years, consistent with the empirical observation of massive split ticket voting in the U.S. electorate. In midterm elections this effort to counterbalance the president's policies should continue. Thus, there will be a shift in allegiance of some voters who supported the president's party during the presiden-

tial election. This shift generates the midterm electoral cycle. Our model does not consider coattails and other explanations of the midterm cycle. Instead, our purpose is to present a model consistent with both these voting regularities and the regularity concerning the macroeconomy.

We eliminate other potential frictions in order to make the model tractable. Specifically, we assume that (1) there are no lagged effects in the polity or the economy and (2) voters are perfectly informed about the preferences of the policy makers and about the state of the economy. These assumptions eliminate any incumbency effect. In addition, since macroeconomic variables depend only on current government policy and agents' expectations of those policies, there is no carryover from past policies. Consequently, we can examine each presidential election and the ensuing congressional election as a two-period game, isolated from past and future history. Alesina and Tabellini (1987) and McKibbin, Roubini, and Sachs (1987) consider models with economic state variables that link current to future administrations.

Matters are further simplified—both for tractability and to highlight the key elements of our model—by assuming that the only source of uncertainty is about the distribution of voter preferences. Thus we have eliminated several important sources of uncertainty. For one, preferences of presidential candidates are assumed known prior to an election. For another, there are no exogenous shocks to the economy. As a result, voters do not need to learn anything about the preferences or competence of politicians from observing the state of the economy. For models with learning and asymmetric information, see Alesina and Cukierman 1987, Cukierman and Meltzer 1986, Rogoff 1987, and Rogoff and Sibert 1988. If learning takes place, we would find retrospective, as well as moderating, voting. In addition to restricting the form of uncertainty, we

also later make further simplifying assumptions for technical reasons. We conjecture that the qualitative nature of our results holds in more general specifications.

The predictions of our model contrast sharply with those of other politico-economic models. Nordhaus (1975) suggested that administrations faced non-rational agents and could therefore create an expansion immediately before elections. This "electoralist" policy would be followed by both parties, since they both care only about reelection. McCallum (1978)—and several others after him—provided a substantial body of empirical results rejecting the Nordhaus model.<sup>2</sup> An alternative to it is provided by Hibbs's "partisan" cycle. Hibbs's work, however, remains similar to Nordhaus's in the assumption of nonrational economic agents, since it is based on a traditional Phillips curve.

On the political side, the major alternative to our model is the retrospective voting formulation introduced by Kramer (1971). (See also Fiorina [1981].) In retrospective models, voters vote for the incumbent president's party in good times and go against it in bad times. Moreover, as argued in most detail by Fair (1978, 1982, n.d.), the data would suggest that voters have short memories. Only the state of the economy in the six months prior to the election has any bearing on the election results. In contrast, in the model we present here, voters vote solely to influence the future of the economy. Since voters have full information about the parties' preferences, past performance is irrelevant in predicting the future. On the other hand, since pivotal voters seek moderation and since the first two years of administrations will lead to fluctuations in output, our model does point to an expected correlation between past economic performance and voting behavior. In "off" years, voting for the Democrats should be negatively correlated with the

deviation from the long-term growth rate of the economy. The reason is that years of above-average growth will occur under a Democratic president. When the electorate votes to moderate Democratic presidents, the Democratic congressional vote will decline. In years when the Democrats hold the White House, the prediction of our model contrasts sharply with that of Kramer and Fair. In years of below-average growth—produced by Republican presidents—the two models agree in predicting that the Democrats will do well.

Finally, it should be noted that Fiorina (1988) has independently developed a model of balancing in elections that is related to ours. While Fiorina does not address the midterm effect, he develops several interesting propositions about split ticket voting that are consistent with our model. However, Fiorina suggests that both types of split ticket voting should be observed. Instead, our definition of equilibrium implies that only one type should be observed. An additional difference between the models is that in Fiorina's only four outcomes are possible, while we consider a continuum of possible outcomes.

Because our model leads to predictions different from those of the literature, we present some empirical analysis of aggregate election results since World War II. We find that much previous work, particularly Kramer's, fails to replicate on this period; whereas our model tests out rather well. Our results cover the Senate as well as the House of Representatives. The empirical section is preceded by a formal presentation of our theoretical model. Finally, we offer some concluding remarks.

### The Model

As in Alesina 1987 the economy is described by a nominal wage contract model, based on Fischer 1977. In this

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model wage setters attempt to maintain the real wage at the level compatible with the natural rate of unemployment. Labor contracts last one period and are signed at the end of, say, period  $(t - 1)$  for period  $t$ . These contracts are noncontingent; in particular, full indexation is excluded. Thus wage setters set the nominal wage growth equal to expected inflation:

$$w_t = \pi_t^e = E(\pi_t | I_{t-1}), \quad (1)$$

where  $w_t$  = nominal wage growth,  $\pi_t$  = rate of inflation,  $E(\cdot)$  is the mathematical expectation operator, and  $I_{t-1}$  is the information set available in period  $(t - 1)$ . The superscript  $e$  indicates rationally expected variables. Given relationship 1, the supply function for this economy can be written as follows:

$$y_t = \gamma(\pi_t - \pi_t^e) + \bar{y}, \quad (2)$$

with  $\gamma > 0, \bar{y} \geq 0$

where  $y_t$  is the rate of growth of output and  $\bar{y}$  is the rate of growth of output compatible with the natural rate of unemployment. We assume that the rate of inflation can be controlled directly by the policy makers.<sup>3</sup>

Electoral competition has the following structure. Every two periods—say, in periods  $t = 0, 2, 4, \dots$ —presidential elections are held. In these elections a president and Congress are elected. We refer to *Congress* as the unique legislative body. In nonpresidential elections years (i.e.,  $t = 1, 3, 5, \dots$ ) a new Congress is elected. The two candidates for president are labeled  $D$  and  $R$ ; and since we do not distinguish between *candidates* and *parties*,  $D$  and  $R$  are used for both interchangeably. The objective functions of the candidates, defined on output and inflation, are given by

$$U^D = - \sum_{t=0}^{\infty} \beta^t [(1/2)(\pi_t - \bar{x}^D)^2 + (b^D/2)(y_t - k^D)^2] \quad (3)$$

$$U^R = - \sum_{t=0}^{\infty} \beta^t [(1/2)(\pi_t - \bar{x}^R)^2 + (b^R/2)(y_t - k^R)^2], \quad (4)$$

(The superscripts identify the party.) The difference in the objectives of the two parties can be captured by the following inequalities:

$$\bar{x}^D \geq \bar{x}^R, b^D \geq b^R, \text{ and } k^D \geq k^R. \quad (5)$$

The two parties are not identical if at least one of the three inequalities in number 5 holds strictly. The first highlights a difference in the desired inflation rate, which can be related to a different need for the inflation tax, for instance, because the two parties disagree about the optimal level of government spending. The second and third capture a different evaluation of the costs on inflation and unemployment. In order to simplify the exposition as much as possible we restrict the difference between the two parties' objectives to the first inequality (which we assume strict) and we impose  $b^D = b^R = 0$ . There is no loss of generality in this simplification because if we substitute relationship 2 into relationships 3 and 4 we would still obtain unidimensional objective functions on inflation, with different optimal and time-consistent policies for the two parties.<sup>4</sup> Thus the objective functions of the two parties are

$$U^D = \sum_{t=0}^{\infty} \beta^t u_t^D = - \sum_{t=0}^{\infty} \beta^t [(1/2)(\pi_t - \bar{x}^D)^2] \quad (6)$$

$$U^R = \sum_{t=0}^{\infty} \beta^t u_t^R = - \sum_{t=0}^{\infty} \beta^t [(1/2)(\pi_t - \bar{x}^R)^2]. \quad (7)$$

Voters, like the candidates, have quadratic preferences defined on inflation and

know the preferences of the two parties; that is, they know relationships 6 and 7. We assume a continuum of voters in which the distribution of voters' bliss points ( $x^i$ ), with  $i$  denoting the generic voter, is uniform. Without further loss of generality, this distribution is of unit length. Its extremes are given by

$$[a, 1 + a], \quad (8)$$

where  $a$  is a random variable with zero mean-distributed on  $(a^{\min}, a^{\max})$ . We also impose the following inequalities:

$$a^{\max} < \bar{x}^R < \bar{x}^D < 1 + a^{\min}, \quad (9)$$

which imply that for any realization of  $a$ , there are voters with bliss points on both sides of  $\bar{x}^R$  and  $\bar{x}^D$ . The distribution of  $a$  and the unit length of the voter distribution are "common knowledge." Since voters' preferences are random, the electoral results are probabilistic even if there is no uncertainty about the policies followed by the two parties if elected.

As a benchmark, consider the case in which Congress has no impact on the inflation policy (or, assume that Congress does not exist). In this case, presidents follow the policies

$$\pi_j^R = \bar{x}^R, \quad \pi_j^D = \bar{x}^D \\ j = (t, t + 1). \quad (10)$$

Voters rationally expect these policies and vote accordingly. In particular, each voter votes for the party with the bliss point closest to his or her own. The probability of electing the Democratic candidate is then given by the probability that the realization of the random variable  $a$  is such that more than half of the voters have a bliss point closer to  $\bar{x}^D$  than to  $\bar{x}^R$ . We indicate this value with  $\bar{P}$ .

In this model the candidates do not converge fully, as in standard median voter models, nor do they partially converge, as in the case of ideologically motivated candidates studied by Wittman (1977, 1983)

and Calvert (1985). In fact, as shown in Alesina 1988a, the two presidents cannot commit to any platform other than relationship 10. For instance, if the Democratic candidate could commit to a pre-electoral platform he or she would choose a convergent policy, lower than the bliss point, in order to capture (probabilistically) middle-of-the-road voters. However, if precommitments are ruled out, voters know that when in office, the presidents would follow their most preferred policies.<sup>5</sup>

Expected inflation is given by

$$\pi_t^e = \bar{P} \bar{x}^D + (1 - \bar{P}) \bar{x}^R, \\ \text{with } t \text{ even} \quad (11)$$

$$\pi_t^e = \bar{x}^D, \text{ with } t \text{ odd, } D \text{ in office;} \\ \pi_t^e = \bar{x}^R, \text{ with } t \text{ odd, } R \text{ in office.} \quad (12)$$

Relationships 11 and 12 underscore that in the first period of a new administration there is expectation uncertainty because contracts have to be signed before the elections. In the second period expectations are correct since the public has learned the identity, and thus the preferences, of the policy maker in office. Thus there is no uncertainty. The implications of relationship 12 for the output equation are as follows:

$$y_t^D = \gamma(1 - \bar{P})(\bar{x}^D - \bar{x}^R) + \bar{y} \\ \text{if } D \text{ elected in period } t, \\ y_t^R = -\gamma\bar{P}(\bar{x}^D - \bar{x}^R) + \bar{y} \\ \text{if } R \text{ elected in period } t, \\ \text{and } y_{t+1} = \bar{y} \text{ if } D \text{ or } R \text{ elected} \\ \text{in period } t. \quad (13)$$

Thus a recession occurs in the first half of a Republican administration and an expansion in the first half of a Democratic administration. There is no difference in output in the second halves of the two administrations.

These are the empirical implications

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successfully tested by Alesina and Sachs (1988) and Alesina (1988b). We now proceed to consider the role of Congress in this model by assuming that in the second period of a term of office the president is constrained in policy making by the composition of Congress. Thus voters use the midterm election to counterbalance the president in office. In every midterm election the party of the president in office loses votes relative to the preceding election.

We assume that if a Republican president is in office in period  $t + 1$  (assuming that presidential elections took place in period  $t$ ) the inflation policy is given by

$$\pi_{t+1}^R = \bar{x}^R + kV^{DR}, \text{ with } k > 0, \quad (14)$$

where  $V^{DR}$  is the share of votes received by the Democrats in the congressional elections held at the beginning of period  $t + 1$ . If a Democratic president is in office in period  $t + 1$ , the inflation policy is given by

$$\pi_{t+1}^D = \bar{x}^D - q(1 - V^{DD}), \quad (15)$$

with  $q > 0$ ,

where  $V^{DD}$  is the share of votes received by the Democrats in the congressional elections held at the beginning of period  $t + 1$ .  $V^{DR}$  and  $V^{DD}$  will be derived endogenously. For simplicity and with no loss of generality we also assume that

$$\bar{x}^D - q > \bar{x}^R + k. \quad (16)$$

The linearity of the functions of relationships 14 and 15 helps in solving the model, but it is not crucial for the qualitative features of the results. In other words, the results derived below are not of the "knife edge" type. They hold for other specifications of relationships between  $V^{DR}$  and  $V^{DD}$  and  $\pi_{t+1}^R$  and  $\pi_{t+1}^D$  in which the curvature of the function is not too far from linearity. Finally, for expositional purposes we assume, for the moment, that in the first period of a term

of office the president is unconstrained by the composition of Congress.<sup>6</sup>

The model is solved by backward induction, in order to ensure dynamic consistency. Thus we start from the midterm elections in period  $t + 1$ . Consider first the case in which a Republican president is in office in period  $t$ . We want to find  $V^{DR}$  under the assumption that the voters know the effect of the composition of Congress on policy making; that is, they know relationship 14. We make use of the following notion of equilibrium:<sup>7</sup>

**DEFINITION.** *A voter equilibrium occurs if and only if no voter would prefer a decrease in the expected vote for the party voted for.*

Since voters have single peaked preferences, there exists a cut point in the distribution of voters' bliss points, labeled  $\bar{x}_R$ , such that every voter with a bliss point higher than  $\bar{x}_R$  votes for the Democratic party, and vice versa. Given the uniform distribution of number 8,  $\bar{x}_R$  satisfies

$$V^{DR} = 1 + a - \bar{x}_R. \quad (17)$$

It is easy to show (by contradiction) that  $\bar{x}_R$  is such that  $\bar{x}^D > \bar{x}_R > \bar{x}^R$ .

The expected utility (when a Republican president  $r$  is in office) of voter  $i$ —with a bliss point  $x^i$  such that  $\bar{x}^D > x^i > \bar{x}^R$ —can be written, using relationships 14 and 17, as

$$\begin{aligned} EU^{Ri} = & \int_{a^{\min}}^{a^{\max}} -(1/2)(\bar{x}^R \\ & + k(1 + a - \bar{x}_R) \\ & - x^i)^2 f(a) da. \end{aligned} \quad (18)$$

Note that relationship 18 would not represent the correct expected utility for the voters with bliss points  $x^j$  such that  $x^j < a^{\max}$  or  $x^j > 1 + a^{\min}$ . In fact, by knowing both their own preferences and the overall uniform distribution of others'



preferences, these voters can infer something about the realization of the random variable  $a$ . Thus their expected utility is *not* given by relationship 18. Since, however, the cut point voter  $\bar{x}_R$  has to lie in between  $\bar{x}^D$  and  $\bar{x}^R$ , given condition 9, this consideration does not affect the proof of Proposition 1. We can then establish the following result.

**PROPOSITION 1.** *The unique cut point  $\bar{x}_R$  is given by  $\bar{x}_R = (\bar{x}^R + k)/(1 + k)$ .*

*Proof.* Given our definition of equilibrium, a necessary and sufficient condition to identify the bliss point of the pivotal voter is the following:

$$\frac{\partial EU^{Ri}}{\partial \bar{x}_R} \begin{matrix} > \\ = 0 \\ < \end{matrix} \text{ if } x^i \begin{matrix} \leq \\ \geq \end{matrix} \bar{x}_R.$$

Thus

$$\begin{aligned} \frac{\partial EU^{Ri}}{\partial \bar{x}_R} &= \int_{a^{\min}}^{a^{\max}} (\bar{x}^R \\ &+ k(1 + a - \bar{x}_R) \\ &- x^i)kf(a)da. \end{aligned} \quad (19)$$

Remembering that

$$\int_{a^{\min}}^{a^{\max}} af(a) = 0$$

relationship 19 implies that

$$\frac{\partial EU^{Ri}}{\partial \bar{x}_R} \begin{matrix} \geq \\ \leq \end{matrix} \text{ if } \bar{x}_R \begin{matrix} \leq \\ \geq \end{matrix} \frac{\bar{x}^R + k}{1 + k}.$$

Therefore the unique cut point is  $\bar{x}_R = (\bar{x}^R + k)/(1 + k)$ . QED

Thus, using relationships 14 and 17 and the result of Proposition 1, we obtain

$$\begin{aligned} E(\pi_{t+1}^R) &\equiv \pi_{t+1}^e = \bar{x}_R \\ &= \frac{\bar{x}^R + k}{1 + k} \end{aligned} \quad (20)$$

and

$$\pi_{t+1}^R = \frac{\bar{x}^R + k}{1 + k} + ka$$

Consider the case in which a Democratic president is in office in period  $t$  and define the cut point  $\bar{x}_D$  by  $V^{DD} = 1 + a - \bar{x}_D$ . By repeating the same procedure described before we obtain<sup>8</sup>

$$E(\pi_{t+1}^R) \equiv \pi_{t+1}^e = \bar{x}_D = \frac{\bar{x}^D}{1 + q} \quad (21)$$

and

$$\pi_{t+1}^D = \frac{\bar{x}^D}{1 + q} + qa.$$

We now turn to the presidential election of period  $t$ . (Recall that we are assuming that in the first period the president is unconstrained by Congress.) The voters have all the information necessary to know which policy would be followed by whoever is elected president in period  $t$ . In addition voters can compute the expected policies for period  $t + 1$  by using relationships 20 and 21. Thus in period  $t$  voter  $i$ , with preferences  $u^i$ , votes for the Democratic candidate if and only if the following holds:

$$\begin{aligned} E[u^i(\bar{x}^D) + \beta u^i(\pi_{t+1}^D)] \\ > E[u^i(\bar{x}^R) + \beta u^i(\pi_{t+1}^R)]. \end{aligned} \quad (22)$$

Relationship 22 underscores that voter  $i$  is better off if a Democratic president is elected in period  $t$  taking account of the expected effects of the midterm congressional elections. Thus, the voters for the Democratic president have bliss points satisfying the following inequality:

$$x^i > A/B$$

where

$$\begin{aligned} A &= \beta\{[E(\pi_{t+1}^D)]^2 - [E(\pi_{t+1}^R)]^2 \\ &+ \text{var}(a)(q^2 - k^2)\} \\ &+ \bar{x}^D{}^2 - \bar{x}^R{}^2 \\ B &= 2\{(\bar{x}^D - \bar{x}^R) \end{aligned} \quad (23)$$

$$+ \beta [E(\pi_{t+1}^D) - E(\pi_{t+1}^R)]$$

In relationship 23  $E(\pi_{t+1}^D)$  and  $E(\pi_{t+1}^R)$

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are defined by relationships 20 and 21, and  $\text{var}(a)$  is the variance of  $a$ .

Let us define  $\hat{x}$  as the bliss point of the voter who is indifferent between voting Republican or Democratic for president in period  $t$ ; thus  $\hat{x}$  is such that relationship 23 holds as an equality. In Appendix A, the following result is shown:

**PROPOSITION 2.** *If  $q = k$ , then the following inequalities hold:  $\bar{x}^R < \bar{x}_R < \hat{x} < \bar{x}_D < \bar{x}^D$ .*

This result is consistent with the empirical observation that the party of the president always loses votes in midterm elections. In fact Proposition 2 shows that there are always voters who switch from the party of the president to the opposing party in order to counterbalance the president's policy in the second half of the term. If  $q \neq k$ , that is, if one of the two potential presidents is more responsive than the other to the composition of Congress, the inequalities of Proposition 2 still hold if  $\text{var}(a)$  is not too big (see Appendix A).

Proposition 2 also establishes a relationship between the economic outcome in the first half of each administration and the midterm electoral results. The basic point is that other things being equal, the more polarized the two parties bliss points are, that is, the more distant  $\bar{x}^D$  and  $\bar{x}^R$  are, the bigger the deviation of output growth from its natural level and the larger the fraction of voters switching from one party to the other in the midterm elections. In fact, consider an increase in the distance between  $\bar{x}^D$  and  $\bar{x}^R$  such that the cut point of the presidential election ( $\hat{x}$ ) remains unchanged. Then the probability of electing a Democratic or Republican president remains unchanged. In this situation it follows from relationship 13 that the deviation of output from its natural level ( $\bar{y}$ ) increases; that is, one observes a bigger expansion or recession in the first half of a Democratic or Republican administration, respectively. For in-

stance, consider the case in which a Republican wins the presidential election. Since  $\bar{x}^R$  has decreased, so does  $\bar{x}_R$  (from relationship 20). This implies that a larger fraction of voters switches from the Republican to the Democratic party in midterm elections.

The same qualitative implications for the midterm electoral cycle holds if Congress is elected every period, that is, in presidential election years as well as in "off" years. In this case the voters can achieve some counterbalancing effect in the first period, too. The complete solution of this case is presented more extensively in Alesina and Rosenthal 1988. Here we simply sketch the solution of the first-period problem, in order to show that the midterm electoral cycle survives this generalization.

When both elections (congressional and presidential) occur contemporaneously in the first period, two cut points are relevant:  $\hat{x}$ , the cut point for the presidential election and  $\bar{x}$ , the cut point for the congressional election. The expected utility of voter  $i$  depends on both cut points. The cut point  $\hat{x}$  determines  $P(\hat{x})$ , that is, the probability of electing a Democrat president. Let us define as interior an equilibrium in which  $\hat{x}$  and  $\bar{x}$  are such that  $0 < P(\bullet) < 1$  and the following condition

$$\left. \frac{\partial EU^i(\hat{x}, \bar{x})}{\partial \bar{x}} \right|_{x^i = \bar{x}} = 0$$

is satisfied.

For our present purposes it is sufficient to establish the following result.

**PROPOSITION 3.** *If an interior equilibrium in the first period exists, then  $\bar{x}_R < \bar{x} < \bar{x}_D$ .*

*Proof.* Suppose not. For given  $\hat{x}$ ,  $\bar{x}$  satisfies the condition

$$\left. \frac{\partial EU^i(\hat{x}, \bar{x})}{\partial \bar{x}} \right|_{x^i = \bar{x}} = P \left. \frac{\partial EU^{Di}(\hat{x}, \bar{x})}{\partial \bar{x}} \right|_{x^i = \bar{x}}$$

$$+ (1 - P) \frac{\partial EU^{Ri}(\hat{x}, \bar{x})}{\partial \hat{x}^i} \Big|_{x^i = \bar{x}} = 0, \quad (24)$$

where  $P$  = probability of electing a Democratic president, which is a constant for a given  $\hat{x}$ ;  $EU^{Di}(\bullet)$  = expected utility of voter  $i$  if a Democrat is elected; and  $EU^{Ri}(\bullet)$  = expected utility if a Republican is elected. It is easy to show that if  $\bar{x} \leq \bar{x}_R$  or  $\bar{x} \geq \bar{x}_D$ ,

$$\frac{\partial EU^{Di}(\hat{x}, \bar{x})}{\partial \bar{x}} \text{ and } \frac{\partial EU^{Ri}(\hat{x}, \bar{x})}{\partial \bar{x}}$$

either have the same sign or one is zero and the other nonzero. Therefore relationship 24 cannot be satisfied. QED

The intuition of this result is straightforward. If, say,  $\bar{x} < \bar{x}_R$ , the voters with bliss points  $x^i$  such that  $\bar{x} < x^i < \bar{x}_R$  act as follows: in the first period, under uncertainty about the president's identity, they vote Democratic for Congress, implying that they would want to counterbalance a Republican president; in the second period when they know that a Republican president is in office, they switch to voting Republican for Congress, reducing the counterbalancing effect. This behavior cannot be rational; thus  $\bar{x} < \bar{x}_R$  cannot be an equilibrium. An analogous argument holds for  $\bar{x} > \bar{x}_D$ .

Alesina and Rosenthal (1988) show that under mild sufficient conditions an "interior equilibrium" in the first period exists and that, in general,  $\hat{x} \neq \bar{x}$ ; that is, there is ticket splitting in the first period. An interior equilibrium is obtained if there is enough uncertainty (i.e., if  $[a^{\max} - a^{\min}]$  is sufficiently high). An explicit solution for  $\hat{x}$  and  $\bar{x}$  can be obtained if  $q = k$  and the distribution of  $a$  is uniform. Simulation results show, however, that these simplifying assumptions are not necessary for existence.

### Aggregate Results for Congressional Elections 1950-84

Our empirical analysis focuses on House and Senate elections from 1950 to 1984. Undoubtedly, some previous investigators had shied away from Senate data because only two-thirds of the states hold Senate elections in a given election year. In fact, results for the Senate are qualitatively similar to those for the House. Testing for "class" effects by including dummy variables generally proved negative. In order to gain degrees of freedom, observations from the interwar period could be used. In this case, however, one has to make more and more heroic assumptions about the stability of the politicoeconomic environment and thus about the stability of coefficients. In addition, if one excludes the observations affected by the two world wars and by the Great Depression, very few useful observations can be obtained for years prior to 1950 in this century.<sup>9</sup>

### Incumbency Models

We begin our data analysis by considering the simplified model of the political process developed in the preceding section. In the model we assumed a perfectly stable environment except for the stochastic variation in the distribution of voters' ideal points, with the result that no variation is predicted in the presidential vote other than that induced by the stochastic process. Thus, this simple model does not suggest any systematic variation in either the presidential vote or the congressional vote in "on" years.<sup>10</sup> In "off" years, in contrast, the model predicts an increase in the vote for the Republicans when the Democrats hold the White House and vice-versa. Given the small number of data points, we assume the two balancing effects to be equal. Thus, we have the following specification:  $V_{R,t} = \beta_0 + \beta_1 M_t + \epsilon_t$  where  $V_{R,t} \equiv$  Republican per-

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centage of two-party vote in year  $t$ .  $M_t \equiv 1$  if incumbent president is Democratic and  $t$  is "off" year,  $-1$  if incumbent president is Republican and  $t$  is "off" year, and  $0$  otherwise; and  $\epsilon_t$  satisfies the standard ordinary least squares assumption (consistent with our model).

As to the coefficients, we hypothesize  $\beta_0, \beta_1 > 0$ . As shown in column 1 of Table 2, the simple model is supported by the data, with conventional significance

levels at .05 or better. The model predicts that the two-party vote will split near its long-term average in presidential years and favor the "outs" by 3.2% in the Senate and 1.8% in the House in midterm elections.

Our simple model captures part of the aggregate fluctuations but leaves much unexplained variance. An alternative model emphasizes a systematic incumbency effect pertaining to both "on" and

**Table 2. Incumbency Regressions**

Variable	House of Representatives				
	(1)	(2)	(3)	(4)	(5)
Constant	46.47 (.57)	46.51 (.58)	46.41 (.57)	46.41 (.48)	46.43 (.47)
M-midterm <sup>a</sup>	1.82 (.81)	1.21 (1.15)	1.81 (.80)	-.97 (1.20)	—
I-incumbent <sup>b</sup>	—	.61 (.82)	—	2.79 (1.00)	2.11 (.55)
DEPR <sup>c</sup>	—	—	-1.15 (1.08)	-3.93 (1.34)	-3.26 (1.04)
Standard error of estimate	2.42	2.42	2.41	2.00	1.97
R <sup>2</sup>	.24	.27	.29	.55	.53
DW	1.13	1.24	1.14	2.03	1.66
Variable	Senate				
	(1)	(2)	(3)	(4)	(5)
Constant	47.67 (.70)	47.66 (.73)	47.50 (.60)	47.50 (.44)	47.50 (.42)
M-midterm	3.21 (.99)	3.37 (1.45)	3.19 (.84)	-.24 (1.11)	—
I-incumbent	—	-.16 (1.03)	—	3.43 (.92)	3.27 (.50)
DEPR	—	—	-3.06 (1.13)	-6.49 (1.24)	-6.33 (.94)
Standard error of estimate	2.97	3.07	2.52	1.85	1.79
R <sup>2</sup>	.40	.40	.59	.80	.80
DW	1.84	1.83	1.88	2.76	2.70

Note: The dependent variable is the Republican percentage of the two-party vote. Numbers in parentheses are standard errors.

<sup>a</sup>M = 1 for Democratic incumbent "off" year,  $-1$  for Republican incumbent "off" year,  $0$  otherwise.

<sup>b</sup>I = 1 for Democratic incumbent,  $-1$  for Republican incumbent.

<sup>c</sup>DEPR = 1 for Democratic incumbent candidate "on" year,  $-1$  for Republican incumbent candidate "on" year,  $0$  otherwise.

"off" years. We thus define  $I_t \equiv 1$  if incumbent president is Democrat and  $-1$  if incumbent president is Republican.

This incumbency variable was included in the specifications of Kramer (1971) and Fair (1978, 1982, n.d.). As seen in column 2 of Table 2, the standard incumbency variable, by itself, does not furnish explanatory power beyond that available in the midterm model.

In addition to the standard incumbency variable, Fair has considered an additional incumbency measure. He defines  $DEPR_t \equiv 1$  if Democratic incumbent president runs for reelection in an "on" year,  $-1$  if Republican incumbent president runs for reelection in an "on" year, and 0 otherwise.

Following Fair (n.d.), we treat Gerald Ford as a nonincumbent in 1976. As shown in column 3 of Table 2, inclusion of  $DEPR$  by itself leaves our estimate of the midterm effect virtually unaffected, although the fit for the Senate is improved substantially. However, when  $M$ ,  $I$ , and  $DEPR$  are all included in the model, there is a strong increase in fit and the midterm effect becomes unimportant (column 4). Indeed, of the various incumbency models, the best model, in terms of the ex post estimated standard error, includes only  $I$  and  $DEPR$ , shown in column 5 of Table 2.

With respect to the results in column 5, note that a midterm effect is still maintained. It is given by the coefficient on  $I$  and is 2.1% in the House and 3.3% in the Senate, quite close to the original estimates in column 1. On the other hand, column 5 contradicts the simple model's hypothesis of only random variation in presidential years. When the incumbent runs for reelection, the congressional party reaps benefits (equal to  $I$  coefficient minus  $DEPR$  coefficient). This incumbency bonus is 1.1% in the House and 3.2% in the Senate.

The  $DEPR$  results need, however, to be

viewed with caution. If we let  $I^* = I - M$ , regressing on  $I^*$  and  $M$  is equivalent to regressing on  $I$  and  $M$ . In turn,  $DEPR$  differs from  $I^*$  only in its treatment of four observations, one of which involves the uncertain coding of Ford. As Fair (n.d.) also noted for the presidency, changing the Ford coding decision substantially alters the results. The column 4, R-squared values drop from .55 to .40 for the House and from .80 to .68 for the Senate. The  $DEPR$  coefficient is not significant at the .05 level in either column 4 or 5 for the House. More fundamentally,  $DEPR$  is not entirely a variable predetermined before the electoral period. Truman in 1952 and Johnson in 1968 were both eligible for reelection. In both cases their decision not to pursue another term may have reflected their and their party's temporary unpopularity as a result of prolonged military conflicts in Asia. Consequently,  $DEPR$  might well be regarded as an endogenous variable, and columns 3-5 are subject to simultaneous equations bias. Of course, it might well make sense, in the spirit of Fair's research, to include  $DEPR$  in a short-term forecasting model (Truman announced his withdrawal on 12 March 1952, Johnson on 30 March 1968).

What is truly predetermined is whether the chief executive is a lame duck. Only two observations in our sample—1960 and 1976—are in this lame duck situation. If  $DEPR$  is recoded to differentiate lame ducks from others, there is a further drop in R-squared, to .36 for column 4 for the House and to .53 for the Senate, while the lesser improvement afforded over column 2 now depends solely on two observations, 1960 and 1976. All in all, there is reason to regard the  $DEPR$  effects with skepticism. Nonetheless, the results suggest that presidential election years contain important lagged incumbency effects that are not captured in our simple model, which treats each four-year term as an independent event.

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### Economic Influences Models

Another set of alternatives to our simple model is posed by various models of economic influences on voting behavior. The essence of the Kramer and Fair models is that the incumbent does well in good times. Growth in real per capita GNP, real per capita income, unemployment, and the inflation rate have been used as indicators of performance. Fair and Kramer find the strongest effects for the first two indicators, and Bloom and Price (1975) consider only the second. Consequently, we restrict ourselves to the first two measures, denoted by  $g$  and  $i$  respectively.<sup>11</sup> Because we have few observations—and in order to avoid collinearity—we use these measures one at a time. Kramer (1971), Fair (1978), and Bloom and Price (1975) all use annual data for the year of the election. Fair (n.d.) concludes in favor of even shorter voter horizons and used data for the second and third quarters preceding the election. We consider both variants.

There are several possible models. (See also Arcelus and Meltzer 1975 and Tufte 1975.) One that Kramer noted for historical reasons but did not investigate is that the Republicans do well in good times. From the viewpoint of our theoretical model, this traditional lore is in fact plausible, since "good times," defined in terms of high GNP growth, but with inflation, should tend to occur in the first half of a Democratic presidency. The regressor for this model, when GNP is the indicator, would simply be  $g$ . In the Kramer and Fair models, good times favor the incumbent, so the regressor is  $-gI$ . Bloom and Price adapt the Kramer model to allow for a "switching" regression. In recessions ( $g < 0$ ), voters react to performance more than in expansions. The Bloom and Price model can be written:  $V_{R,t} = \beta_0 + \beta_1[-g_t^+g_tI_t] + \beta_2[-(1-g_t^+)g_tI_t] + \epsilon_t$  where  $g_t^+ = 1$  if  $g_t > 0$  and 0 otherwise.

The hypothesis of the model is that  $\beta_2 > \beta_1 \geq 0$ .

In contrast to these models, our simple approach suggests that if economic factors relate to voting at all it will only be a spurious correlation produced by the expectation uncertainty of economic agents and the moderating behavior of voters. The relevant economic variable should be deviation from trend. We consider  $(g - \alpha)I$ , where  $\alpha$  is a target level for the economy. As in the other models, the coefficient on this variable should be positive. We either set  $\alpha$  equal to the average growth rate of the economy over the time period of our data set or treat  $\alpha$  as a parameter to be estimated by nonlinear least squares. Another interpretation of this model is that voters are retrospective but more sophisticated than the "naive" voters of Kramer, Fair, and Bloom and Price. Sophisticated voters do not view too-high growth in the short run as desirable. Such growth may be seen as potentially inflationary, or, more generally, voters may prefer a stable growth path rather than fluctuations of growth. This view of the model is congruent with the approach of Chappell (1983) and Chappell and Keech (1985). The model with squared deviation also is congruent with Lepper's (1974) finding that incumbents lose votes when either unemployment or inflation is high. Note that not all observations discriminate among the models. Our squared deviation model will look much like a Republican prosperity model as long as prosperity coincides with Democrats in office and recessions coincide with Republican administrations. Similarly, squared deviations parallel Bloom and Price in calling for recessions to be severely punished. Squared deviations and Kramer and Fair basically agree for  $g < \alpha$ . Consequently, with only 18 observations, it is difficult to discriminate between the models.

We begin our discussion of "economic" models by considering simple GNP

Table 3. Simple Economic Influences Regressions

Variable	House of Representatives				
	Prosperity	Kramer-Fair	Bloom-Price	Squared Deviation	
				Fixed	Estimated
Constant	45.45* (.85)	46.18* (.67)	46.60* (.69)	46.59* (.57)	46.83* (.81)
$g^a$	.31 (.20)	—	—	—	—
$-gI^b$	—	-.15 (.16)	—	—	—
$-g^+gI^c$	—	—	-.16 (.15)	—	—
$-(1 - g^+)gI$	—	—	1.27 (.97)	—	—
$(g - \alpha)^2I$	—	—	—	.10* (.04)	.09 (.07)
$\alpha^d$	—	—	—	2.96 (fixed)	3.77* (1.88)
Standard error of estimate	2.58	2.70	2.59	2.40	2.23
$R^2$	.14	.05	.18	.25**	.27**
DW	1.46	2.05	1.51	1.45	—
2lnL	—	—	—	—	-80.01
Variable	Senate				
	Prosperity	Kramer-Fair	Bloom-Price	Squared Deviation	
				Fixed	Estimated
Constant	45.31* (.96)	46.18* (.67)	48.17* (.92)	46.59* (.57)	48.54* (.69)
$g$	.74* (.22)	—	—	—	—
$-gI$	—	-.06 (.22)	—	—	—
$-g^+gI$	—	—	-.08 (.20)	—	—
$-(1 - g^+)gI$	—	—	2.58 (1.25)	—	—
$(g - \alpha)^2I$	—	—	—	.13* (.06)	.06 (.08)
$\alpha$	—	—	—	2.96 (fixed)	7.00 (4.33)
Standard error of estimate	2.94	3.81	3.45	3.39	2.90
$R^2$	.41**	.01	.24	.21	.35**
DW	2.28	2.68	2.33	2.53	—
2lnL	—	—	—	—	-89.42

Note: Numbers in parentheses are standard errors.

<sup>a</sup>See Appendix B.

<sup>b</sup>See Table 2.

<sup>c</sup>The variable  $g^+ = 1$  if  $g > 0$ , = 0 otherwise.

<sup>d</sup>Target growth rate parameter.

\*Coefficient significantly differs from 0 at .05 level or better (one-tailed).

\*\*F-test for regression significant at .05 level or better.

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models, using growth rates from the year of election, as shown in Table 3. An immediate observation is that none of the models substantially outperforms any of the incumbency models, including the very simple midterm effects model. The Kramer and Fair model does particularly poorly, and the Bloom and Price model also does not do very well. None of these "naive" retrospective regressions passes the standard .05 level. In terms of the standard error of the estimate (SE) both are dominated by the prosperity and squared deviation models. The negative results for the Kramer and Fair and Bloom and Price models are important when viewed in the context of these authors' results. In Kramer's original paper a simple economic model based on real income was highly significant. As he added variables to this initial regression, the economic growth variable remained the driving variable. In the case of Bloom and Price the simple model was the only one they presented. Our results indicate that these earlier retrospective voting models are not robust to alterations in the time period and data series.

The prosperity model does poorly for the House but quite well for the Senate. The squared deviation model with fixed  $\alpha$  is more stable. The squared deviation variable is significant for both chambers. The slope estimates for the House and Senate are quite similar. Estimating the "target" parameter  $\alpha$  improves the fit slightly in the House and substantially in the Senate. The data, however, do not permit obtaining precise estimates of both  $\alpha$  and the coefficient on the squared deviation. We thus cannot reject the null hypothesis that  $\alpha = 2.96$ , the average GNP growth rate in the 1950-84 period. On the whole, the evidence in Tables 2 and 3 is at least as supportive of our balancing model as of retrospective voting models. To sum up,

1. Simple retrospective voting models do

not outperform the model of Republicans' doing well under prosperity.

2. Simple retrospective voting models do not outperform the model of incumbents' being punished for deviations from a target level of growth.
3. None of the models based on GNP growth rates for the year of the election fits the data substantially better than the simple midterm effect model (column 1 of Table 2).

One important claim of proponents of retrospective voting models is that the horizon employed by the voters is very short. However, our theoretical model would suggest that two years—rather than one year—prior to the election would be relevant. The reason is that the spurious correlation between voters' moderating behavior and the partisan business cycle is likely to be improved by the averaging implied in including data for both years prior to an election. Consequently, we reestimated all the models shown in Table 3 by also including all relevant variables lagged one year. Results are shown in Table 4. To save space, we group the variables for the various models in a block of lines. The variables and their orders are as shown in Table 3.

Our hypothesis concerning the squared deviation models is confirmed. For fixed  $\alpha$ , both lagged coefficients are significant.<sup>12</sup> Consistent with the averaging we expected, we cannot reject the hypothesis that the coefficients on the squared deviation variables are equal. When  $\alpha$  is estimated, there is a significant improvement in the log likelihood for both houses. At the same time, the retrospective voting models are "improved" for the Senate (but not the House). The F-test for Kramer and Fair is significant. The driving variable, with the wrong sign, is lagged GNP. Bloom and Price's lagged recession variable is also significant. Their model shows at least as large an effect from negative growth one year prior to the election as in



Table 4. Economic Influences, Lagged Regressions

Variable	House			Squared Deviation	
	Prosperity	Kramer-Fair	Bloom-Price	Fixed	Estimated
Constant	45.45* (1.22)	46.30* (.67)	47.04* (.73)	46.41* (.54)	46.83* (.81)
g variables <sup>a</sup>	.32 (.19)	-.05 (.19)	.05 (.21)	.08* (.04)	.05 (.09)
	—	—	1.27 (.97)	—	—
g <sub>-1</sub> variables <sup>b</sup>	.27 (.24)	-.16 (.18)	-.17 (.20)	.08* (.04)	.11 (.18)
	—	—	3.58 (2.33)	—	—
$\alpha^a$	—	—	—	2.96 (fixed)	4.67* (2.31)
Standard error of estimate	2.56	2.72	2.54	2.21	1.82
R	.20	.10	.32	.41	.52**
DW	1.60	1.86	1.82	1.90	—
2lnL	—	—	—	—	-72.56
	Senate				
Constant	43.64* (1.32)	47.77* (.94)	48.81* (.90)	47.48* (.72)	47.93* (.66)
g variables	.75* (.21)	.24 (.24)	.37 (.26)	.10* (.06)	.10 (.09)
	—	—	2.11* (1.18)	—	—
g <sub>-1</sub> variables	.45 (.26)	-.49 (.23)	-.50 (.24)	.12* (.05)	.13 (.22)
	—	—	4.74* (2.84)	—	—
$\alpha$	—	—	—	2.96 (fixed)	3.93* (1.46)
Standard error of estimate	2.78	3.44	3.45	2.98	2.58
R <sup>2</sup>	.50	.24**	.47	.43**	.49**
DW	2.25	2.30	2.41	2.66	—
2lnL	—	—	—	—	-85.25

Note: Numbers in parentheses are standard errors.

<sup>a</sup>See Table 3 for definitions.

<sup>b</sup>Table 3 variables lagged one year.

\*Coefficient significantly differs from 0 at .05 level or better (one-tailed).

\*\*F-test or likelihood ratio test for including lagged terms in regression significant at .05 level or better.

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the year of the election. Although the coefficients are not estimated precisely, the House runs are similar—retrospective voting models show larger effects from the lagged data. So we have

4. The data do not support the claims of voter myopia found in the retrospective voting literature.
5. The squared deviation models are significantly improved by including GNP data for the year preceding the election year.

To address the emphasis found in Kramer and Bloom and Price, we redid all the regressions in Tables 3 and 4 using  $i$  in place of  $g$ . We summarize the result:

6. The income measure is not a good candidate for an explanatory variable in simple economic models of aggregate congressional voting. The fits are generally worse than those for the GNP variable. When the fits are better, coefficient values are not as hypothesized by the naive retrospective voting models.

In his series of studies on presidential voting, Fair has also focused on real GNP as the main predictor. Fair (n.d.) claims (at least for presidential elections) that it is mainly *per capita* growth in the second and third quarters of an election year that matters. Consequently, we also estimated the models of Table 3 and the no-lags columns of Table 5 with  $g_t$  redefined to be the annualized per capita growth in the second and third quarters of year  $t$ .<sup>13</sup> Again the results are negative. The prosperity and Kramer and Fair models are always worse for the two-period growth rate than for the growth rate for all of the election year. The squared deviation model is better for the House, with incumbency and trend, and worse elsewhere. The Bloom and Price model does better in the House run ( $R^2 = .29$  vs.  $.18$ ) but worse in the Senate ( $.09$  vs.  $.21$ ).

Our comparisons of the various models of economic influences on voting behavior have been limited to simple linear regressions including an economic variable and its lag or, in the case of Bloom and Price, a piecewise linear regression. The literature, however, includes variables that measure noneconomic influences. Specifically, both Kramer and Fair included  $I$  and  $t$  (time trend) as additional regressors. The results, presented in Table 5, of comparing the Kramer and Fair model and the squared deviation model when  $I$  and  $t$  are included are quite instructive.

All the results in Table 5 must be viewed with caution, given the number of coefficients relative to degrees of freedom. Indeed, only two of the eight F-tests (testing the null hypothesis that all coefficients, save the constant, are zero) for the overall regression are significant at the .05 level. Neither of the two models dominates. Without the lagged variable, the Kramer and Fair model always has a better fit than the squared deviation. Indeed, the lagged variable does not noticeably improve the fit for Kramer and Fair, in line with the previous retrospective voting lore. However, the squared deviation model, with the lag, is nearly as good as the Kramer and Fair model for the House and substantially better for the Senate. This gives us

7. In a specification that includes an incumbency variable and a time trend there is no clear case for a Kramer and Fair retrospective voting model, based on short memory, versus a squared deviation model, in which lags are important.

What is most interesting about Table 5, however, is the pattern of the coefficients. Introducing incumbency into the Kramer and Fair model makes a dramatic difference in fit. (Compare Table 5 with Tables 3 and 4.) Incumbency costs the

**Table 5. Economic Influences Regressions: GNP, Incumbency, and Trend**

Variable	House			
	Kramer-Fair		Squared Deviation	
	No Lags	Lags	No Lags	Lags
Constant	49.31* (1.40)	49.38* (1.43)	46.67* (1.25)	46.69* (1.39)
g variable	.38 (.22)	.40 (.23)	.05 (.07)	.09 (.07)
g <sub>-1</sub> variable	—	.16 (.23)	—	.08 (.05)
I	2.21** (.85)	2.84** (1.26)	.66 (.86)	-.19 (1.02)
t <sup>a</sup>	-.23 (.12)	-.23 (.12)	-.12 (.12)	-.03 (.13)
α	—	—	2.96 (fixed)	2.96 (fixed)
Standard error of estimate	2.26	2.30	2.45	2.29
R <sup>2</sup>	.42***	.44	.32	.41
DW	1.51	1.47	1.69	1.91
	Senate			
	Kramer-Fair		Squared Deviation	
	No Lags	Lags	No Lags	Lags
Constant	50.56* (1.98)	50.49* (2.04)	47.56* (1.83)	45.14* (1.72)
g variable	.68* (.32)	.66* (.33)	.10 (.10)	.20* (.09)
g <sub>-1</sub> variable	—	-.16 (.32)	—	.19* (.07)
I	3.50** (1.20)	2.85 (1.26)	.63 (1.26)	-1.47 (1.26)
t	-.19 (.16)	-.19 (.17)	.02 (.18)	.24 (.16)
α	—	—	2.96 (fixed)	2.96 (fixed)
Standard error of estimate	3.20	3.29	3.59	2.92
R <sup>2</sup>	.39	.40	.23	.53***
DW	2.33	2.28	2.50	2.81

Note: Numbers in parentheses are standard errors.

<sup>a</sup>Time in years, 1950 = 1. See Tables 3 and 4 for other variable definitions.

\*Coefficient significantly differs from 0 at .05 level or better (one-tailed).

\*\*Coefficient significantly differs from 0 and .05 level or better (two-tailed).

\*\*\*F-test or likelihood ratio test for regression significant at .05 level or better.

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"ins" about 2.2% of the vote in the House and 3.5% in the Senate. These figures are quite close to our original estimate of the midterm effect. While GNP growth now has the correct sign, it clearly has a subsidiary role to incumbency and has a significant coefficient only in the House runs. For GNP growth to have an effect roughly equal to that of incumbency, growth would either have to fall from its average level of around 3% to about -2% (a major recession level attained by only 1982 in the data) or accelerate to 8% (a boom level that occurred only before the 1950 election).

In contrast to the Kramer and Fair model, the squared deviation model estimates never show a significant incumbency effect. The estimates for incumbency are never as much as one-third those in the corresponding Kramer and Fair model and, moreover, are negative in the lagged model. Adding incumbency helps the overall fit of the original simple model only slightly. The GNP coefficient estimates retain the signs found in Tables 3 and 4 but are significant only in the lagged model for the Senate. What has happened is that the coefficients are not precisely estimated as a result of the predicted collinearity between  $I$  and  $(g - \alpha)^2 I$ .

When we run a full Fair (n.d.) model (minus the weak, nonsignificant inflation variable) by including *DEPR*, we obtain results similar to the simple regression shown in Table 2. Just as the  $M$  coefficient was near zero when both  $I$  and *DEPR* were included, the squared deviation coefficients are near zero when *DEPR* is added to the model of Table 5. While the naive retrospective  $g$  variable is slightly more successful in this context (again a lagged version is more favorable to squared deviations), the critical variables in Fair's specifications are noneconomic. In both chambers the change in GNP growth from the average would have to be over 10% for the estimated impact to

equal that of  $I$ . Such a change is beyond all the sample values of  $g$ . Similarly, according to the *DEPR* model, a party will gain more from getting its incumbent to stand for another term than it could ever possibly achieve by successful management of the economy. Although the *DEPR* model puts a twist on presidential factors not captured in our model, the basic empirical results square with the thrust of our model—elections are not driven by economic performance but by forces internal to the political process.

Our simple theory, of course, also predicts that the squared deviation model will not improve on the simple midterm effect variable  $M$ . This observation brings us directly to our empirical punch line. Neither GNP variable improves on our simple midterm effect model. We show this in Table 6, where the  $I$  dummy variable in Table 5 has simply been replaced by  $M$ . (The  $I$  variable still appears in the  $g$  variables.) Substituting  $M$  for  $I$  in a classical Kramer model is something of a draw—the House results are worse and the Senate results are better. In both cases, however, GNP growth has a negligible effect. The only significant coefficient appears in the lagged Senate model, but there the lagged coefficient has the wrong sign while the sum of the two coefficients is roughly zero. A similar story holds for squared deviations. Here the  $R$ -squared is better than with  $I$  for both Senate and House. No coefficients are significant in the House run, whereas they are significant when  $M$  and squared deviations are run separately. The lack of significance in Table 6 reflects the anticipated collinearity between the two variables. One lagged coefficient is significant in the Senate, but—no surprise at this point—the unlagged coefficient has the wrong sign. Thus,

8. Simple models of economic influences add little, if anything, to the basic midterm effects model.

**Table 6. Economic Influences Regressions: GNP, Midterm, and Trend**

Variable	House			
	Kramer-Fair		Squared Deviation	
	No Lags	Lags	No Lags	Lags
Constant	48.24* (1.37)	48.43* (1.44)	47.87* (1.26)	47.08* (1.30)
g variable <sup>a</sup>	.07 (.16)	.13 (.19)	.02 (.08)	.02 (.08)
g <sub>-1</sub> variable	—	-.10 (.18)	—	.07 (.04)
M	1.84* (.88)	1.63 (1.26)	1.46 (1.45)	1.20 (1.39)
t	-.18 (.12)	-.19 (.13)	-.15 (.12)	-.08 (.13)
α	—	—	2.96 (fixed)	2.96 (fixed)
Standard error of estimate	2.40	2.46	2.41	2.30
R <sup>2</sup>	.35	.36	.34	.44
DW	1.22	1.22	1.34	1.71
	Senate			
	Kramer-Fair		Squared Deviation	
	No Lags	Lags	No Lags	Lags
Constant	49.03* (1.72)	49.62* (1.68)	48.31* (1.64)	46.77* (1.47)
g variable	.25 (.21)	.42* (.23)	-.06 (.11)	-.05 (.09)
g <sub>-1</sub> variable	—	-.32 (.21)	—	.13* (.05)
M	3.70* (1.10)	3.05* (1.26)	4.07* (1.89)	3.57* (1.57)
t	-.11 (.15)	-.15 (.15)	-.08 (.16)	.06 (.14)
α	—	—	2.96 (fixed)	2.96 (fixed)
Standard error of estimate	3.02	2.88	3.13	2.60
R <sup>2</sup>	.45***	.54***	.41***	.63***
DW	1.66	1.44	1.76	1.91

Note: Numbers in parentheses are standard errors.

<sup>a</sup>See Tables 2, 3, 4, and 5 for variable definitions.

\*Coefficient significantly differs from 0 at .05 level or better (one-tailed).

\*\*Coefficient significantly differs from 0 at .05 level or better (two-tailed).

\*\*\*F-test or likelihood ratio test for regression significant at .05 level or better.

### Conclusion

We have presented a simple but internally consistent macromodel of an economic and political system. The model is obviously very crude, and further theoretical work will need both to bring in dynamics that would enrich the two-period focus of the current model and to relax simplifying technical assumptions. The model we have presented does, however, capture some critical features of some modern political systems.

The economic side of the model accounts for the notion that economic agents cannot be routinely fooled by the government. With rational expectations, anticipated efforts at manipulating the economy should have no effect on the real level of output. On the other hand, agents enter into contracts that are sufficiently long-term that they can only attempt more or less successfully to hedge against the uncertainty generated by politics.

In addition to the assumption of voters' rationality, the political side of the model has three key features: (1) a two-party system in which politicians are polarized, (2) policy that reflects the influence of both the executive and the legislature, and (3) an institutional structure with legislative elections held while the executive remains in power. The United States and France are the two reasonably good fits to our stylized environment.

The upshot of our stylized "political economy" is that political polarization and uncertainty generate economic fluctuations and that voters use the legislative elections to attenuate the policy swings engendered by polarization. Within the context of our model these concurrent economic and political events generate a purely spurious correlation between current economic conditions and voting behavior in the legislative elections.

In our empirical section we provide evidence for the spurious correlation. The midterm effect portrayed by our model

was strongly supported by the data, while various "economic" models of voting behavior failed to generate much additional explanatory power.

Our empirical results help to reconcile the findings from survey data that individual voting behavior is not responsive to changes in individual economic outcomes (Kiewiet 1981; Kinder and Kiewiet 1979) and the supposed regularity that aggregate voting behavior responds to aggregate economic conditions. While Kramer (1983) provided an elegant methodological reconciliation based on the observation that the survey questions failed to differentiate overall individual changes in economic fortunes from the portion of the change the individual attributed to government, our findings question the existence of the regularity for the postwar period, at least so far as congressional elections are concerned.

The near-zero correlations we have obtained between standard "retrospective" regressors and *congressional* outcomes contrasts with the very high R-squared values Fair (n.d.) has obtained for *presidential* elections. Markus (1988), using survey data, also finds strong support for retrospective voting using survey data for the 1956–84 period. (See also Chubb 1988 on state legislative elections.) It is thus quite possible that both retrospective and moderating influences are present. In voting for the presidency, voters use the past to evaluate the current presidential party but—having selected the chief executive—invariably choose moderation in the off-year elections.

Our model has also not considered many other important influences on voting behavior. Just before this paper went to the editor, an important paper by Erikson (1988) appeared. After a careful statistical analysis of alternative hypotheses about the midterm effect, he concludes, "Standard interpretations in terms of withdrawn coattails (or regression to the mean), surge and decline, [and] a

negative referendum verdict on presidential performance are all incompatible with the empirical evidence" (p. 1028). Erikson does find support for a "presidential penalty" model similar to ours, in which, "to create a balance of power between the two parties, . . . voters would be motivated to oppose the presidential party at midterm" (p. 1014).

What we have added to Erikson's framework (and that of Fiorina [1988]) is an explicit consideration of the coordination problem facing the voters and a treatment of how uncertainty interacts with the coordination problem. An important implication of uncertainty for our model is that hedging causes the presidential year cut point for the congressional vote to be intermediate between those of the two midterm cut points. Unless one party always won the presidency, we would thus predict more variance in the midterm series than in the presidential year series. The data, as previously noted by Jacobson and Kernell (1983), are strongly in accord with this prediction.

In addition to the midterm effect, our model predicts split ticket voting. Obviously, there are other explanations for split tickets, most notably, each voter's incentive to feather the constituency's congressional nest by continuing to reelect the current incumbent. Although Fiorina (1988) reports substantial split ticket voting in "on" years in open seats, the incumbency incentives are probably the major factor in limiting the midterm effect to only about 2.5% of the electorate. That the midterm effect exists at all responds to the fact that open seats arise and to the possibility that many individuals (e.g., professors who participate in national labor markets, retirees) are more responsive to the direction of national economy policy than to increments to local pork.

## Appendix A: Proof of Proposition 2

The inequalities  $\bar{x}^R < \bar{x}_R < \bar{x}_D < \bar{x}^D$  can be easily established by using relationships 9, 16, 20 and 21. The inequalities  $\bar{x}_R < \hat{x} < \bar{x}_D$  can be established as follows. If  $q = k$ , relationship 23 can be rewritten as an equality as follows:

$$\hat{x} = \frac{\beta(\bar{x}_D^2 - \bar{x}_R^2) + \bar{x}^{D^2} - \bar{x}^{R^2}}{2[(\bar{x}^D - \bar{x}^R) + \beta(\bar{x}_D - \bar{x}_R)]} \quad (\text{A-1})$$

We want to show first that

$$\bar{x}_D > \hat{x}. \quad (\text{A-2})$$

From relationship A-1, relationship A-2 implies, after rearrangement,

$$\begin{aligned} 2\bar{x}_D(\bar{x}^D - \bar{x}^R) + 2\beta\bar{x}_D(\bar{x}_D - \bar{x}_R) \\ > \beta(\bar{x}_D - \bar{x}_R)(\bar{x}_R + \bar{x}_D) \\ + (\bar{x}^D - \bar{x}^R)(\bar{x}^D + \bar{x}^R) \end{aligned}$$

or

$$\begin{aligned} (\bar{x}^D - \bar{x}^R)[2\bar{x}_D - (\bar{x}^D + \bar{x}^R)] \\ + \beta(\bar{x}_D - \bar{x}_R)^2 > 0. \end{aligned} \quad (\text{A-3})$$

The second term in relationship A-3 is positive. The first is also positive if

$$\bar{x}_D > \frac{\bar{x}^D + \bar{x}^R}{2} \quad (\text{A-4})$$

If  $q = k$ , relationship 16 implies the following inequalities:

$$\bar{x}^D - k > \frac{\bar{x}^D + \bar{x}^R}{2} > \bar{x}^R + k. \quad (\text{A-5})$$

Condition 9 implies  $0 < V^{DD} < 1$ , which implies  $\bar{x}_D > \bar{x}^D - k$ . Consequently, relationship A-5 implies relationship A-4. Thus relationship A-5 holds. By repeating the same procedure one obtains  $\hat{x} > \bar{x}_R$  if and only if

$$\begin{aligned} (\bar{x}^D - \bar{x}^R)[2\bar{x}_R - (\bar{x}^D + \bar{x}^R)] \\ - \beta(\bar{x}_D - \bar{x}_R)^2 < 0. \end{aligned} \quad (\text{A-6})$$

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Using relationships 16 and A-5 one can easily show that relationship A-6 holds. QED

Consider now the case of  $q \neq k$ . The inequalities corresponding to relationships A-3 and A-6 are as follows:

$$\begin{aligned} & (\bar{x}^D - \bar{x}^R)[2\bar{x}_D - (\bar{x}^D + \bar{x}^R)] \\ & + \beta(\bar{x}_D - \bar{x}_R)^2 \\ & > (q^2 - k^2)\text{Var}(a) \end{aligned} \quad (\text{A-7})$$

$$\begin{aligned} & (\bar{x}^D - \bar{x}^R)[2\bar{x}_R - (\bar{x}^D + \bar{x}^R)] \\ & - \beta(\bar{x}_D - \bar{x}_R)^2 \\ & < (q^2 - k^2)\text{Var}(a). \end{aligned} \quad (\text{A-8})$$

Relationships A-7 and A-8 show what is claimed in the text, precisely that Proposition 2 holds also for  $q \neq k$  as long as  $q$  and  $k$  are not too different or  $\text{var}(a)$  is not too high. QED

## Appendix B: Data

Year	Republican Share of Two-Party Vote		Growth Rate				
	House	Senate	Real GNP		Real GNP, 2d, 3d Quarters per Capita	Real Income per Capita	
			$g$	$g_{-1}$		$i$	$i_{-1}$
1950	49.959	50.534	8.539	.027	12.109	7.062	-1.995
1952	49.844	53.712	3.902	10.345	-.337	2.580	2.465
1954	47.272	43.665	-1.329	4.004	-.145	-1.249	3.571
1956	48.797	48.905	2.059	5.555	-.688	3.919	5.590
1958	43.603	44.027	-.766	1.670	4.199	-1.393	.376
1960	45.029	44.534	2.219	5.836	-1.917	1.600	3.729
1962	47.363	49.235	5.310	2.608	2.477	3.551	1.249
1964	42.498	43.247	5.336	4.108	2.380	4.266	2.332
1966	48.673	51.617	5.787	5.792	1.434	4.470	5.170
1968	49.078	49.189	4.152	2.852	4.002	4.242	3.224
1970	45.775	44.989	-.292	2.436	.948	.420	2.695
1972	47.335	53.679	4.980	2.839	5.054	5.138	1.808
1974	41.323	42.013	-.536	5.195	-2.951	-1.973	4.676
1976	42.754	44.635	4.887	-1.259	.781	3.530	-1.553
1978	45.678	48.590	5.290	4.669	7.072	3.648	2.979
1980	48.714	47.394	-.160	2.476	-5.694	-3.328	-2.254
1982	43.782	44.039	-2.546	1.931	-2.009	-1.226	.098
1984	47.220	50.862	6.429	3.572	2.693	4.110	1.992

## Notes

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1. See, however, the controversy between Beck (1982, 1984b) and Hibbs (1983). Hibbs (1987) has recently showed additional empirical evidence in favor of his view. For empirical evidence in European countries see Alt 1985.

2. For some results more favorable to Nordhaus see Haynes and Stone 1987 and Grier 1987.

3. Alternatively, the model could be closed by a quantity theory equation such as  $m_t = \pi_t + y_t$ , where  $m_t$  is the rate of money growth; in this case one could assume that the policy makers control money growth rather than inflation. The shortcut adopted in the text simplifies the notation without affecting in any way the results. We disregard the issue of the partial independence of the Federal Reserve. See Alesina 1988b on this issue in a related context. In addition, there are no shocks affecting the supply function as expressed in relationship 2. For a related model with supply shocks see Balke



1988. This author shows that economic shocks may affect voters' choices because each of the two parties is more suited to respond optimally to different types of shocks. These issues are not considered here.

4. This simplification eliminates the issue of time inconsistency of optimal monetary policy in rational expectations models pointed out by Kydland and Prescott (1977) and Barro and Gordon (1983). The time inconsistency arises if the unexpected inflation term enters the utility functions of the two parties. By not including output in the objective functions we avoid such a term. If  $b^D \neq b^R \neq 0$ , we would simply have that the time-consistent policies followed by the two parties when in office would imply a higher-than-optimal inflation rate. Our positive politicoeconomic results would be unaffected. Alesina (1987, 1988b) and Alesina and Sachs (1988) show extensively how to deal with this time inconsistency problem in two-party models.

5. Policy convergence can be achieved only if the electoral game is modeled as a repeated game, so that reputational mechanisms can be accounted for. See Alesina 1987, 1988a; Alesina and Cukierman 1987; and Alesina and Spear n.d. for repeated electoral games with ideologically motivated politicians and see Ferejohn 1986 and Rogoff and Sibert 1988 for repeated electoral games with purely office motivated politicians. We do not consider reputational mechanisms here, i.e., we consider every election as a one-shot game.

6. The specification adopted for the effect of Congress on policy making is perhaps more appropriate for the case of proportional representation, which does not apply to the U.S. Congress.

7. In a companion paper (Alesina and Rosenthal 1988) we show that this simple definition implies that the resulting equilibria are Von Neumann-Morgenstern abstract stable sets for Greenberg's (n.d.) dominance relation, a generalization of Bernheim, Peleg, and Whinston's (1987) coalition-proof Nash refinement. Greenberg's generalization enables us to treat the case of a continuum of voters.

8. Note that in the model with Congress the realization of the random variable  $a$  can generate unexpected inflation or deflation even in the second period of any administration.

9. Like Fair (n.d.), we report results based on the latest revisions of the data, which in the case of GNP have been quite substantial. However, such a choice is problematic. Kramer (1983) argues that one should model voters as basing their decisions not on changes in their total income but on changes in income that they attribute to governmental activity. However, one may argue that voters' assessments reflect the "real" economy rather than the "unrevised" announcements made by the government in the period before election. We have checked our analysis with respect to GNP data by using the CITIBASE series prior to the 1986 revisions. The results

from the older series are somewhat more favorable to our argument.

10. We do not include presidential voting in this paper. We completely agree with Fair (1978), who, citing work by Lepper (1974), argues that it was unreasonable for Kramer (1971) to have estimated a model in which presidential and House elections were considered in a single model with constrained coefficients.

11. Our work uses real GNP (net per capita). Results for annual per capita growth rates are very similar to those presented here.

12. For the House, the F-test, which is equivalent to a two-tailed t-test here, is not significant, whereas the one-tailed t-test on the lagged variable is.

13. Like Fair (n.d.), we used  $G_{t,q}$  = real GNP for quarter  $q$  in year  $t$  from CITIBASE file GNP82 and  $P_{t,q}$  = quarterly population figures that Fair obtained from the Council of Economic Advisors. We computed  $g$  from the formula

$$g_t = 100[(G_{t,3}/P_{t,3})^2 - 1] / (G_{t,2}/P_{t,2})$$

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